4.6 AIR QUALITY AND CLIMATE CHANGE

Park Plan Guideline AO-3.3-1 states:

> *Consult with applicable air pollution control districts (APCDs) and/or air quality management districts (AQMDs) prior to any major facility development projects in the Park, and implement all rules and regulations as required by these agencies.*

Pursuant to this Guideline, this section includes a description of existing air quality conditions, summary of applicable regulations, and an analysis of potential short-term and long-term air quality impacts of the proposed project. The method of analysis for short-term construction, long-term regional (operational), local mobile source, odor, and toxic air contaminant (TAC) emissions is consistent with the recommendations of the Butte County Air Quality Management District (BCAQMD). The analysis also includes consideration of the potential contribution of the project to global climate change through the production of greenhouse gas emissions (GHGs). In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

4.6.1 ENVIRONMENTAL SETTING

The project site is located in Butte County, which is within the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB also comprises all of Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties (BCAQMD 2004). The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors which affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6,000 feet with peaks rising much higher. The mountain ranges provide a substantial physical barrier to locally created pollution as well as pollution that is transported northward on prevailing winds from the Sacramento Metropolitan area. Although a significant area of the NSVAB is 1,000 above feet sea level, the vast majority of its populace lives and works below that elevation. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems (BCAQMD 2004).

Meteorology (weather) and topography play major roles in ozone formation in the NSVAB. When the weather is warm and the winds are light, a vertical downward motion of air and a natural cooling of the earth's surface act together to form an inversion that traps pollutants. Sunlight then causes a chemical reaction between the hydrocarbons and oxides of nitrogen (NO_X) to form ozone. The NSVAB is shaped like an elongated bowl. Temperature inversion layers can clamp a lid on the bowl, allowing air pollution to rise to unhealthy levels. Weather conditions cause air pollution concentrations to fluctuate widely from day to day and season to season.

Topography alone gives the NSVAB great potential for trapping and accumulating air pollutants. The strong inversions typical of NSVAB summers are caused by subsidence, the slow sinking of air causing compress ional warming. The surface inversions typical of winter are formed primarily at night as air is cooled when it comes in contact with the earth's cold surface. These are called radiation inversions. Temperature inversions prevent pollutants from rising and being diluted vertically. Thus, pollutants remain trapped in the layer of air where people breathe. Summer subsidence inversions occur on over 90% of summer days; they persist throughout the day and tend to intensify during the afternoon. Winter radiation inversions occur on over 70% of winter nights,

but are usually destroyed by daytime heating, bringing a rapid improvement in air quality by afternoon. Both types of inversion mechanisms may operate at any time of the year, and in the fall both may occur together to produce the heaviest pollution potential (BCAQMD 2004).

EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants" (CAPs).

A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below along with the most current attainment area designations and monitoring data for the project area.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection (Godish 2004). Ground level ozone also damages forests, agricultural crops, and some human-made materials, such as rubber, paint, and plastics.

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2006a).

The highest concentrations are generally associated with cold stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (EPA 2006a). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (EPA 2006a). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2006a).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis,

and premature death (EPA 2006a). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. Environmental Protection Agency (EPA) set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995 (EPA 2006a).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78% decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded (EPA 2006a).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a TAC.

MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

Criteria air pollutant concentrations are measured at several monitoring stations in the NSVAB. The monitoring station closest to the proposed project site is located approximately 8 miles east of the Singh and Nicolaus parcels at on Manzanita Avenue in Chico. Table 4.6-1 summarizes the air quality data from these two stations for the most recent 3 years, 2004 through 2006. The data is not necessarily representative of the project site, because of the distance from the monitor to the site and the monitor location was meant to measure the highest urban ozone concentrations in Chico.

Both ARB and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the Butte County portion of the NSVAB are shown in Table 4.6-2 for each criteria air pollutant.

Table 4.6-1
Summary of Annual Ambient Air Quality Data (2004–2006) — Chico Monitoring Station[1]

	2004	2005	2006
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.088/0.073	0.083/0.077	0.090/0.080
Number of days state standard exceeded (1-hr)	0	0	0
Number of days national standard exceeded (1-hr/8-hr)	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hr, ppm)	0.056	0.048	0.048
Number of days state standard exceeded (1-hr)	0	0	0
Annual Average (ppm)	0.011	0.009	0.009
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$)	76.3	82.7	76.1
Number of days national standard exceeded (measured[2])	0	1	1
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$)	115.0	76.0	81.0
Number of days state standard exceeded (calculated[2])	5	5	7
Number of days national standard exceeded (calculated[2])	0	0	0

Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

1 Measurements of ozone, NO_2, PM_{10}, and $PM_{2.5}$ are from the Manzanita Avenue Station, Chico, CA

2 Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2007b, EPA 2006b.

Table 4.6-2
Ambient Air Quality Standards and Butte County Attainment Status

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N	-[9]	-	-
	8-hour	0.070 ppm[8] (137 µg/m^3)	–	0.08 ppm (157 µg/m^3)	Same as Primary Standard	N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	U[11]	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)[12]	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	–[13]	Same as Primary Standard	A
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	Same as Primary Standard	A
	24-hour	–	–	35 µg/m^3		
Lead[10]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	
Sulfates	24-hour	25 µg/m^3	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[10]	24-hour	0.01 ppm (26 µg/m^3)	U/A			

Table 4.6-2
Ambient Air Quality Standards and Butte County Attainment Status

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. The California ambient air quality standard for NO_2 was amended on February 22, 2007 to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm.

[3] Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.

Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] This concentration effective May 17, 2006.

[9] The 1-hour ozone NAAQS was revoked on June 15, 2005.

[10] ARB has identified lead and vinyl chloride as TACs with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[11] Designation for Butte County; the designation is different for one or more other counties in the NSVAB.

[12] The CAAQS were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

[13] Because of a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard on September 21, 2006.

Source: BCAQMD 2007a; ARB 2007b

EXISTING AIR QUALITY—GREENHOUSE GASES AND LINKS TO GLOBAL CLIMATE

Change

Various gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). It is *extremely unlikely* that global climate change of the past 50 years can be explained without the contribution from human activities (Intergovernmental Panel on Climate Change [IPCC] 2007).

Climate change is a global problem. GHGs are global pollutants, unlike CAPs and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of CAPs and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice to say, the quantity is enormous, and no single project alone would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Feedback Mechanisms and Uncertainty

Many complex mechanisms interact within Earth's energy budget to establish the global average temperature and global and regional climate conditions. For example, increases in atmospheric temperature would lead to increases in ocean temperature. As atmospheric and ocean temperatures increase, sea ice and glaciers are expected to melt, adding more fresh water to the ocean and altering salinity conditions. Both increases in ocean temperature and changes in salinity would be expected to lead to changes in circulation of ocean currents. Changes in current circulation would further alter ocean temperatures and alter terrestrial climates where currents have changed. Several interacting atmospheric, climatic, hydrologic, and terrestrial factors affecting global climate change are described below. These factors result in feedback mechanisms that could potentially increase or decrease the effects of global climate change. There is uncertainty about how some factors may affect global climate change because they have the potential to both intensify and neutralize future climate warming. Examples of these conditions are described below.

Direct and Indirect Aerosol Effects

Aerosols, including particulate matter, reflect sunlight back to space. As air quality goals for particulate matter are met and fewer emissions of particulate matter occur, the cooling effect of aerosols would be reduced, and the Greenhouse Effect would be further intensified. Similarly, aerosols act as cloud condensation nuclei, aiding in cloud formation and increasing cloud lifetime. Under some circumstances (see discussion of the cloud effect below), clouds efficiently reflect solar radiation back to space. With a reduction in emissions of particulate matter, including aerosols, the direct and indirect positive effect of aerosols on clouds would be reduced, potentially further amplifying the Greenhouse Effect.

The Cloud Effect

As global temperature rises, the ability of the air to hold moisture increases, facilitating cloud formation. As stated above, clouds can efficiently reflect solar radiation back to space. If an increase in cloud cover occurs at low or middle altitudes, resulting in clouds with greater liquid water content, such as stratus or cumulus clouds, more radiation would be reflected back to space than under current conditions. This would result in a negative feedback mechanism, in which the increase in cloud cover resulting from global climate change acts to balance the amount of further warming. If clouds form at higher altitudes in the form of cirrus clouds, however, these clouds allow more solar radiation to pass through than they reflect and ultimately act as GHGs themselves. This results in a positive feedback mechanism, in which the side effect of global climate change (an increase in cloud cover) acts to intensify the warming process. Because of the conflicting feedback mechanisms to which increasing cloud cover can contribute, this cloud effect is an area of relatively high uncertainty for scientists when projecting future global climate change conditions.

Other Feedback Mechanisms

As global temperature continues to rise, CH_4 gas trapped in permafrost is expected to be released into the atmosphere. As identified above in the description of CO_2 equivalents, CH_4 is approximately 23 times as efficient a GHG as CO_2; therefore, this release of CH_4 would accelerate and intensify global climate change if current trends continue. Additionally, as the surface area of polar and sea ice continues to diminish, Earth's albedo, or reflectivity, also is anticipated to decrease. More incoming solar radiation likely will be absorbed by the earth rather than be reflected back into space, further intensifying the Greenhouse Effect and associated global climate change. These and other both positive and negative feedback mechanisms are still being studied by the scientific community to better understand their potential effects on global climate change. The specific incremental increase in global average temperature that will result from the interaction of all the pertinent variables has not been pinpointed at this time. Although the amount and rate of increase in global average temperature are uncertain, there is no longer much debate within the scientific community that global climate change is occurring and that human-caused GHG emissions are contributing to this phenomenon.

ATTRIBUTING CLIMATE CHANGE—GREENHOUSE GAS EMISSION SOURCES

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission [CEC] 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006a). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) is largely associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006a). California produced 499 million gross metric tons of CO_2 equivalent (CO_2e) in 2004 (ARB 2007a). CO_2e is a measurement used to account for the

fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (CCAR 2007), 1 ton of CH_4 has the same contribution to the Greenhouse Effect as approximately 23 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the Greenhouse Effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (CEC 2006a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%) (CEC 2006a).

ADAPTATION TO CLIMATE CHANGE

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2007). Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state (including the project site). According to the California Energy Commission (2006b), the snowpack portion of the water supply could potentially decline by 30–90% by the end of the 21st century. A study cited in a report by the California Department of Water Resources (DWR) projects that approximately 50% of the statewide snowpack will be lost by the end of the century (Knowles and Cayan 2002). Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system (DWR 2006).

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century (CEC 2006b), and it is predicted to rise an additional 7–22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion (especially a concern in the low-lying Sacramento–San Joaquin River Delta, where pumps delivering potable water could be threatened), and disruption of wetlands (CEC 2006b). As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available.

The project site is situated approximately 100 to 150 feet above mean sea level and, thus, would not be directly affected by the potential sea level rise predicted to occur over the next 100 years. However, the project area could experience increased flooding and associated displacement of residents and businesses due to rising sea levels.

4.6.2 REGULATORY SETTING

Air quality within Butte County is regulated by EPA, ARB, and BCAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

U.S. Environmental Protection Agency

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 4.6-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO2, PM_{10}, $PM_{2.5}$ and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformation to the mandates of the CAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

In April 2007 the Supreme Court of the United States ruled that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. However, there are no federal regulations or policies regarding GHG emissions applicable to the proposed project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Air Resources Board

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (Table 4.6-2). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. There are 15 nonattainment areas for the national ozone standard and two nonattainment areas for the $PM_{2.5}$ standard. The Ozone SIP and $PM_{2.5}$ SIP must be adopted and sent to EPA by June 2007 and April 2008, respectively. The SIP must show how each area will attain the federal standards. To do this, the SIP will identify the amount of pollution emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for ozone and $PM_{2.5}$. The Draft Statewide Air Quality Plan was released in April 2007 (ARB 2007).

Airborne Toxic Control Measures (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling

As part of its diesel risk reduction plan, ARB has developed an air toxic control measure that limits stationary idling by diesel-fueled commercial trucks to 5 minutes (13 CCR Chapter 10 Section 2485).

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 ARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. Emissions requirements adopted as part of 13 CCR 1961.1 are shown in Table 4.6-3. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37% lower than the limits for the first year of the regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions are reduced approximately 24% between 2009 and 2016.

Table 4.6-3
Fleet-Average Greenhouse Gas Exhaust Emission Limits Included in CCR 13 1961.1

Vehicle Model Year	Fleet-Average Greenhouse Gas Emissions (carbon dioxide equivalents in grams per mile)	
	Light-Duty Trucks 0–3,750 Pounds LVW and Passenger Cars	Light-Duty Trucks 3,751 Pounds LVW to 8,500 Pounds GVW and Medium-Duty Passenger Vehicles*
2009	323	439
2010	301	420
2011	267	390
2012	233	361
2013	227	355
2014	222	350
2015	213	341
2016	205	332

Notes:
GVW = gross vehicle weight.
LVW = loaded vehicle weight.
* Specific characteristics of passenger cars, light-duty trucks, and medium-duty passenger vehicles are provided in Title 13, Section 1900 of the California Code of Regulations as amended to comply with Assembly Bill 1493.
Source: California Code of Regulations, Title 13, Section 1961.1

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of 13 CCR Sections 1900 and 1961 as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al.*). The suit, still in process in the U.S. District Court for the Eastern District of California, contends that California's implementation of regulations that, in effect, regulate vehicle fuel economy violates various federal laws, regulations, and policies. To date, the suit has not been settled, and the judge has issued an injunction stating that ARB cannot enforce the regulations in question before receiving appropriate authorization from EPA.

In January 2007, the judge hearing the case accepted a request from the State Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the Supreme Court case, *Massachusetts, et al., v. Environmental Protection Agency, et al.*, the primary issue in question was whether the federal Clean Air Act (CAA) provides authority for EPA to regulate CO_2 emissions. EPA contended that the CAA does not authorize regulation of CO_2 emissions, whereas Massachusetts and 10 other states, including California, sued EPA to begin regulating CO_2. The U.S. Supreme Court ruled on April 2, 2007, that GHGs are "air pollutants" as defined under the federal Clean Air Act and EPA is granted authority to regulate CO_2 (*Massachusetts v. U.S. Environmental Protection Agency* [2007] 549 U.S. 05-1120). After this decision, the U.S. District Court for the Eastern District of California was then willing to hear arguments by automobile manufacturers about the legality of AB 1493. On December 12, 2007, the Court rejected the automakers claim and ruled that if California receives appropriate authorization from EPA (the last remaining factor in enforcing the standard), these regulations would not be consistent with federal law.

Since the request was made in 2005, EPA has failed to act on granting California authorization to implement the standards. EPA rejected the California's request for a waiver in December 2007 and Governor Schwarzenegger and Attorney General Brown have filed suit against the EPA for this decision.

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created the California Climate Action Team (CCAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies

that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 does not explicitly apply to emissions from land development, though emissions associated with land development projects are closely connected to the utilities, transportation, and commercial end-use sectors. Further, because AB 32 imposes a statewide emissions cap, land development-related emissions will ultimately factor in to considerations of GHG emissions in the state.

Senate Bills 1771 and 527 and the California Climate Action Registry

The California Climate Action Registry (CCAR) was established in 2001 by Senate Bills 1771 and 527 as a nonprofit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Senate Bill 97

Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the State Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. The Resources Agency is required to certify or adopt those guidelines by January 1, 2010. This bill also removes inadequate CEQA analysis of effects of GHG emissions from projects (retroactive and future) funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E) as a legitimate cause of action. This provision will be repealed on January 1, 2010, wherein inadequate CEQA analysis for those projects could then become a legitimate cause of action. This bill would only protect a handful of public agencies from CEQA challenges on certain types of projects for a few years time.

LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Butte County Air Quality Management District

BCAQMD is the primary local agency responsible for protecting the people and the environment of Butte County from the effects of air pollution. BCAQMD is responsible for adopting rules that limit pollution, issuing permits

to ensure compliance, and inspecting pollution sources. BCAQMD also monitors air quality in the county and prepares plans to demonstrate how compliance with state and federal standards would be attained and maintained.

Air Quality Plans

Federal and State air quality laws also require regions designated as nonattainment to prepare plans that demonstrate how the region will attain the pollutant standard. Air quality planning in the Northern Sacramento Valley Air Basin has been undertaken on a joint basis by the air districts in seven counties, including Butte County. The current plan, the 2003 Air Quality Attainment Plan, is an update of plans prepared in 1994, 1997, and 2000. The purpose of the plan is to achieve and maintain healthful air quality throughout the air basin. The 2003 Air Quality Attainment Plan addresses the progress made in implementing the 2000 plan and proposes modifications to the strategies necessary to attain the California ambient air quality standard for the 1-hour ozone standard at the earliest practicable date. BCAQMD has current air quality plans for ozone and PM_{10}.

Fugitive Dust Mitigation Measures

For all dust-generating activities, BCAQMD requires implementation of all applicable fugitive dust control measures, as listed in its Compliance Advisory Bulletin (BCAQMD 2007b), for projects that emit fugitive dust during land development activities.

General Prohibitions and Exemptions on Open Burning (Rule 300)

BCAQMD Rule 300 prohibits the use of outdoor open fires. Part 2.10 of the rule exempts open outdoor fires used for cooking food for human beings from the burn prohibition rule.

"Don't Light Tonight" Program

"Don't Light Tonight" is a voluntary program during the fall and winter in which BCAQMD asks residents not to use their woodstoves and fireplaces when air pollution approaches unhealthy levels (BCAQMD 2007c). The program is aimed at keeping pollution levels of particulate matter below the health-based standards. The season begins in mid-November and extends through February.

Butte County Fire Rescue/California Department of Forestry and Fire Protection

The responsible fire protection agency for the unincorporated areas of Butte County is Butte County Fire Rescue/California Department of Forestry and Fire Protection (Cal-Fire) (Butte County Fire Rescue 2007). Cal-Fire imposes a burn ban during the wildfire season, which typically begins around July 1 and extends through October 31. Burn-ban periods established by Cal-Fire apply to all vegetative and wood burning, including campfires and other burning activities on state land inside Butte County, with no exceptions made by on BCAQMD Rule 300, part 2.10 (Williams, pers. comm., 2007). Information about burn bans imposed by Cal-Fire is posted on BCAQMD's web site as a public service.

Butte County General Plan

There is no air quality element in the existing Butte County General Plan. Butte County is currently developing a draft Air Quality Element for its ongoing update of the County General Plan; however, the draft Air Quality Element has not yet been approved by the County Board of Supervisors and, therefore, is not available to the public.

4.6.3 ENVIRONMENTAL IMPACTS

METHOD OF ANALYSIS

Emissions of short-term construction-related and long-term operation-related (i.e., regional and local) criteria air pollutants and precursors, odors, and TACs were assessed in accordance with the *Indirect Source Review Guidelines* published by BCAQMD (BCAQMD 1997) and consultation with BCAQMD staff.

Project-generated, restoration- and construction-related emissions of criteria air pollutants (e.g., PM_{10}) and precursors (i.e., ROG and NO_X) were assessed in accordance with BCAQMD-recommended methods. Where quantification was required, emissions were modeled using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007e). Modeled restoration- and construction-related emissions were compared with applicable BCAQMD action levels to determine whether mitigation would be required.

Project-generated, operation-related (i.e., regional) emissions of criteria air pollutants and precursors (e.g., mobile- and area-sources) were also quantified using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007e). Modeling was based on project-specific data (e.g., size and type of proposed uses) and assumptions about vehicle trips associated with the proposed project, as outlined in Appendix F.

At this time, BCAQMD has not adopted a methodology for analyzing short-term construction-related emissions of TACs. Therefore, restoration- and construction-related emissions of TACs were assessed in a qualitative manner.

To date, BCAQMD has not adopted a method for evaluating impacts associated with emissions of $PM_{2.5}$. However, because project-generated, construction- and operation-related emissions of $PM_{2.5}$, by definition, would be a subset of PM_{10} emissions, BCAQMD-recommended methodologies and mitigation measures for PM_{10} would also be relevant to emissions of $PM_{2.5}$.

Project-generated emissions of GHGs would predominantly be in the form of CO_2. While emissions of other GHGs, such as methane, are important with respect to global climate change, the project is not expected to emit significant quantities of GHGs other than CO_2. The reason for this conclusion is that most emissions from the project are associated with campfire burning and vehicular emissions. Though vehicles also emit small quantities of N_20 and CH_4, the primary GHG emitted during fuel combustion is CO_2. Thus, project-generated emissions of CO_2 were used as a proxy for total emissions GHGs. Operational CO_2 emissions were quantified using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007e). Indirect emissions of CO_2 associated with electricity consumption were addressed in a qualitative manner.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines, an air quality impact is considered significant if implementation of the proposed project would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan,
- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions which exceed quantitative thresholds for ozone precursors),
- expose sensitive receptors to substantial pollutant concentrations, or

- create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance of criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. BCAQMD's *Indirect Source Review Guidelines* (BCAQMD 1997) include tiered "action-levels" for recommending whether standard and/or best available mitigation measures should be implemented. The action-level thresholds are consistent with the New Source Review requirements for permitting stationary sources that have been adopted by BCAQMD, as well as other air quality management districts in the NSVAB. The action-level thresholds illustrate the extent of indirect source impacts resulting from projects, and are a basis for determining the need to apply mitigation. They are intended for use as a guide rather than strict, absolute values. The three action levels and associated mitigation measures are summarized below:

- Level A: Indirect sources which have the potential to emit less than 25 pounds per day (lb/day) of ROG or NO_X, or less than 80 lb/day of PM_{10}, would be subject to the recommended list of standard mitigation measure.

- Level B: Indirect sources which have the potential to emit 25 lb/day of ROG or NO_X, or 80 lb/day of PM_{10}, or any nonattainment criteria pollutant would select as many supplemental mitigation measures as are feasible, in addition to the recommended list of standard mitigation measures.

- Level C: Indirect sources which have the potential to emit 137 lb/day or greater (25 tons per year) of ROG or NO_X, PM_{10}, or any nonattainment criteria pollutant would select as many supplemental mitigation measures as are feasible, in addition to the recommended list of standard mitigation measures. Depending on factors specific to the project, an environmental impact report may also be necessary under CEQA.

Thus, a project would have a significant impact on air quality if it would generate emissions that exceed any of the above action levels and does not incorporate all applicable BCAQMD-recommended mitigation, or if a project generates emissions that exceed the Level C action levels despite implementation of all feasible mitigation. In all cases, developers would be required to coordinate with the Planning Agencies to identify feasible mitigation measures.

In addition, the following thresholds of significance have been used to determine whether implementation of the proposed project would result in significant impacts with respect to global climate change. A global climate change impact is considered significant if implementation of the proposed project under consideration would do any of the following:

- Conflict with or obstruct state or local policies or ordinances established for the purpose of reducing GHG emissions, or

- Result in a considerable net increase in GHGs.

With regard to emissions of GHGs, no air district in California, including the BCAQMD, has identified a significance threshold for analyzing project-generated emissions or a methodology for analyzing air quality impacts related to global warming. Nonetheless, by adoption of AB 32, California has identified that global climate change is a serious environmental issue, and has identified GHG reduction goals.

To meet AB 32 goals, California as a whole will ultimately need to generate substantially less GHG than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall emission levels of GHGs.

While AB 32 focuses on stationary sources of emissions, the primary objective of AB 32 is to reduce California's contribution to global warming by reducing California's total annual production emissions. The impact that emissions of GHGs have on global climate change is not dependent on whether they were generated by stationary,

mobile, or area sources; or whether they were generated in one region or another. Thus, the net change in total levels of GHGs generated by a project or activity is the best metric for determining whether the proposed project would contribute to global warming.

The effect of GHG emissions as they relate to global climate change is inherently a cumulative impact issue. While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. In the case of the proposed project, if the size of the increase in emissions from the project is considered to be substantial, then the impact of the project would be cumulatively considerable.

4.6.4 IMPACT ANALYSIS

IMPACT 4.6-a **Generation of Short-Term Restoration- and Construction-Related Emissions of Criteria Air Pollutants and Precursors.** *Project-generated, restoration-related emissions levels of criteria air pollutants and precursors would not be substantially different from those currently generated by existing on-site orchard operations. However, emissions of ROG and PM_{10} associated with the construction of the campground and new park headquarters would exceed associated BCAQMD trigger levels for incorporating applicable recommended emission reduction measures. Because applicable BCAQMD-recommended mitigation measures are not currently incorporated into the project description, this impact would be* ***significant****.*

The proposed project would include the restoration of approximately 150 acres of agricultural land to native riparian habitat, new campgrounds, day use facilities, and conversion of existing farm buildings on the Nicolaus parcel to the new headquarters of BSRSP. Habitat restoration would occur over an approximate 4-year period and include the removal of orchard trees with heavy equipment, discing of soils, irrigation system maintenance, spraying of herbicides for weed control, hauling of supplies to the site, and commute trips by restoration workers. Project-generated, restoration-related activities, and their associated emissions levels, would be not be substantially different from those that currently occur from existing on-site operations of walnut and almond orchards. For example, discing of soils performed before the planting of native species during restoration would generate levels of fugitive PM_{10} dust emissions similar to those from the activity of "clean-tilling" the orchard floor (i.e., discing, dragging, and rolling) before mechanical harvesting of the orchard trees. In addition, because restoration activities would involve equipment similar to those used under existing orchard maintenance, project-generated exhaust emissions of ozone precursors, ROG and NO_X, would not substantially differ from those that currently occur on-site.

However, short-term emissions would also be generated by construction of the campground and conversion of the existing farm buildings on the Nicolaus parcel to the new park headquarters. Construction of the proposed project would temporarily generate emissions of ROG, NO_X, and PM_{10} from site grading and excavation; motor vehicle exhaust associated with construction equipment, employee commute trips, and material transport; application of architectural coatings; paving; and other construction operations. Site grading would generally occur in the first phase of construction before other activities begin. Other construction activities, such as paving, building construction, and application of architectural coatings, would then follow. No soil would be imported or removed from the site, though removed orchard trees may be hauled to an off-site location. New emissions associated with these construction activities were estimated using the ARB-approved URBEMIS 2007 Version 9.2.2 computer program (ARB 2007e). URBEMIS is designed to model construction emissions for land use development projects and allows for the input of specific project information. It is assumed that construction would begin in the spring of 2008 and would be completed in approximately three months. The estimation of daily construction emissions is presented in Table 4.6-4.

Table 4.6-4
Summary of Modeled Project-Generated, Construction-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (lb/day) 1			
	ROG	NO_X	PM_{10}	$PM_{2.5}$ 2
Phase 1: Grading3				
Fugitive Dust	—	—	120.0	25.1
Off-Road Diesel Exhaust	4.6	37.7	2.0	1.9
Worker Trips	0.1	0.1	0.0	0.0
Subtotal Unmitigated	4.7	37.9	122.0	26.9
Phase 2: Paving				
Off-Gas Emissions	2.1	0.0	0.0	0.0
Off-Road Diesel Exhaust	2.8	16.4	1.4	1.3
On-Road Diesel Exhaust	0.5	7.4	0.3	0.3
Worker Trips	0.1	0.2	0.0	0.0
Subtotal Unmitigated	5.5	24.0	1.8	1.6
Phase 3: Building Construction				
Off-Road Diesel Exhaust	4.1	18.2	1.3	1.2
Vendor Trips	0.0	0.1	0.0	0.0
Worker Trips	3.0	5.8	0.7	0.4
Subtotal Unmitigated	7.1	24.2	2.0	1.6
Phase 4: Architectural Coatings				
Off-Gas Emissions	9.7	0.0	0.0	0.0
Worker Trips	0.0	0.0	0.0	0.0
Subtotal Unmitigated	9.7	0.0	0.0	0.0
Maximum Daily Emissions, Unmitigated	**9.7**	**37.9**	**122.0**	**26.9**

Notes: See Appendix F for detailed assumptions, input parameters, and modeling results.

1 All emission estimates assume that construction of the campgrounds and new park headquarters would occur simultaneously.

2 Estimated $PM_{2.5}$ emissions are shown for informational purposes only. BCAQMD has not identified mass emissions thresholds for emissions of $PM_{2.5}$.

3 Additional emissions would be generated if removed orchard trees are hauled to an off-site location such as the wood waste-to-energy power facility operated by Pacific Oroville Power, Inc. in conjunction with NorCal Waste Systems in Oroville, CA. These emissions would not be substantial because the hauling would be performed by on-road haul trucks and the site is relatively close proximity to the Oroville facility.

Sources: Modeling performed by EDAW 2007.

The BCAQMD has established tiered "action-levels" for recommending whether standard and/or best available mitigation measures should be implemented. Various mitigation measures are recommended for proposed projects based whether they exceed Level A, Level B, or Level C Action Triggers. As shown in Table 4.6-4, the maximum daily ROG emissions during project construction would not exceed BCAQMD's Level B trigger level for ROG of 25 lb/day. However, the maximum daily NO_X emissions of 37.9 lb/day, which would occur during site grading, would exceed the Level B trigger level for NO_X of 25 lb/day. Due to this exceedance, BCAQMD recommends implementation of all standard and best available mitigation measures applicable to the project. Additionally, grading activities associated with building construction would emit approximately 122.0 lb/day of PM_{10}, which exceeds BCAQMD's Level B trigger level for PM_{10} of 25 lb/day, as shown in Table 4.6-4, and additional PM_{10}

fugitive dust would also be generated by earth disturbance during restoration activities. For all dust-generating activities, BCAQMD requires implementation of all applicable fugitive dust control measures, as listed in its Compliance Advisory Bulletin (BCAQMD 2007b), for projects that emit fugitive dust during land development activities. Without implementation of all applicable BCAQMD-recommended mitigation measures during site restoration and construction of the campgrounds and new park headquarters, project emissions would be considered a **significant** impact.

IMPACT 4.6-b **Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursor Emissions.** *Operation of the proposed campgrounds, relocated headquarters, and new day-use facilities would result in project-generated emissions of PM_{10} that exceed BCAQMD's "Level B" trigger level of 80 lb/day and emissions of ROG that exceed BCAQMD's "Level C" action-level threshold of 137 lb/day (refer to Table 4.6-5). Thus, project-generated, operation-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Butte County. In addition, project-generated emissions could also conflict with air quality planning efforts. As a result, this would be a* ***significant*** *impact.*

Table 4.6-5
Summary of Modeled Project-Generated, Operation-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$[8]
Area Source[2]				
Campfires[3]	440.5	5.0	66.6	64.1
Natural Gas[4]	0.0	0.2	0.0	0.0
Landscaping	1.0	0.1	0.0	0.0
Architectural Coatings	0.1	0.0	0.0	0.0
Mobile Source[5]				
Campgrounds[6]	10.7	14.0	13.6	2.6
Headquarters and Day Uses[7]	2.2	2.7	2.5	0.5
Total Net Unmitigated	**454.4**	**22.0**	**82.6**	**67.2**

1 Emissions were modeled using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007e).

2 Area-source emission estimated do not include emissions from consumer products (e.g., air fresheners, household cleaners, personal care products) because new emissions from with these sources are primarily associated with increased population related to residential development (ARB 1990). In addition, area-source emission estimates do not include emissions from the potential use of charcoal lighter fluid and camping fuel at the campgrounds, which would be expected to be nominal relative to overall operational emissions.

3 A conservative estimate of maximum daily campfire emissions was generated using the default emission rates in the open hearth module of URBEMIS and assumptions about the amount of wood burned per day in each of 55 fire rings at the proposed campsites (see Appendix F for assumptions). It is unknown whether the campfires would represent a net increase compared to emissions from biomass burning that is currently part of the existing orchard operations.

4 Emissions from natural gas consumption would be associated with water heating for the restroom and shower buildings at the campgrounds, and space and water heating at the new park headquarters.

5 Maximum daily mobile-source emissions were estimated assuming the campgrounds, new headquarters, and day use facilities would be operating at full capacity during a summer day, using default trip lengths for rural trips. The default fleet mix was adjusted to account for RV use at each RV camp site and limited trips by commercial-sized trucks.

6 A trip generation rate of 4.0 trips per day was assumed for each campsite.

7 Assumptions regarding peak operations of the new park headquarters, campgrounds, and day use facilities generated an estimation that these facilities would generate a combined 210 trips per day.

8 The BCAQMD has not identified mass emissions thresholds for operational emissions of $PM_{2.5}$.

See Appendix F for detailed assumptions, input parameters, and modeling results.

Sources: Modeling performed by EDAW 2007

Project-generated, regional area- and mobile-source emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were also estimated using URBEMIS 2007 Version 9.2.2 computer program (ARB 2007e), which is designed to model operational emissions for land use development projects. URBEMIS allows land use selections that include project location and vehicle trip parameters (e.g., trip generation rates, fleet mix). URBEMIS accounts for area-source emissions from the usage of natural gas, wood burning, and landscape maintenance equipment, and mobile-source emissions associated with vehicle trips. Regional area- and mobile-source emissions were estimated based on the proposed land uses type identified in Chapter 3, "Project Description," the estimated increase in vehicle trips generated by the proposed project (presented in Appendix F) and default model settings for conditions in the NSVAB in the earliest year when the project would become completely operational, 2009. Results of the URBEMIS modeling are shown in Table 4.6-5. Refer to Appendix F for detailed assumptions, modeling input parameters, and modeling results.

During the peak camping season, unmitigated long-term regional emissions would reach 454.4 lb/day of ROG, 22.0 lb/day of NO_X, and 82.6 lb/day of PM_{10}, and 67.2 lb/day of $PM_{2.5}$. As shown in Table 4.6-5, campfires would generate most of the emissions of ROG, PM_{10}, and $PM_{2.5}$ while most of the NO_X emissions would be generated by vehicle travel associated with park operations.

Based on the modeling conducted, operation-related activities would result in project-generated emissions of PM_{10} that exceed BCAQMD's "Level B" action-level threshold of 80 lb/day. In addition, project-generated emissions of ROG would exceed BCAQMD's "Level C" action-level threshold of 137 lb/day. While wood burning activities at the campgrounds would be the predominant source of operational emissions (as shown in Table 4.6-5), it is uncertain whether the project would result in a net increase in ROG and PM_{10} emissions because biomass burning is practiced under the existing operations at the walnut and almond orchards. Vegetative debris is typically piled and burned on site after regular pruning of orchard trees. Thus, the net change in burning-related emissions would depend on the amount of burning that currently takes place at the project site orchards and the actual amount of burning that would take place in the approximately 55 campfire rings. Nonetheless, campfire emissions along with other project-generated, operation-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Butte County for PM_{10}. Also, project-generated emissions could potentially conflict with current air quality planning efforts. As a result, this would be a **significant** impact.

It is important to note that project implementation would also result in emissions of CO due to mobile-sources (vehicles). However, because CO disperses rapidly with increased distance from the source, emissions of CO are considered localized pollutants of concern rather than of regional concern and are discussed separately, below.

IMPACT 4.6-c **Local Mobile-Source Carbon Monoxide Emissions.** *The proposed project would not result in, or contribute to, congestion on nearby roadways or at nearby intersections and, as such, would not result in or contribute to CO concentrations that exceed the California 1-hour CO ambient air quality standard of 20 parts per million (ppm) or the 8-hour CO ambient air quality standard of 9 ppm. As a result, this would be considered a* ***less-than-significant*** *impact.*

The proposed project would not result in, or contribute to, congestion on nearby roadways or at nearby intersections and, as such, would not result in or contribute to CO concentrations that exceed the California 1-hour CO ambient air quality standard of 20 ppm or the 8-hour CO ambient air quality standard of 9 ppm. CO emissions are a direct function of vehicle idling time and, thus, traffic flow conditions. Under specific meteorological conditions, the concentration of CO emissions near congested roadways and/or intersections may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools, and hospitals. A detailed traffic analysis was not prepared for this study. However, high levels of traffic congestion do not currently occur on nearby roads or at intersections in the project area, which is rural in nature. Additionally, vehicle trips generated by the proposed project are not expected to be concentrated during any particular time of day such that they would result in congested roadways or intersections during peak periods. Thus, the proposed project would not be

expected to result in or contribute to CO concentrations that exceed the California 1-hour CO ambient air quality standard of 20 ppm or the 8-hour CO ambient air quality standard of 9 ppm.

IMPACT 4.6-d Odor Emissions. *Odorous diesel exhaust emissions from on-site construction and restoration equipment would be temporary and intermittent in nature and dissipate rapidly from the source. Also, the proposed project would not include the long-term operation of an odorous emission source. Odorous emissions may occur when the RV dump station is serviced (i.e., biosolids removed); however, pumping of the RV dump station would be performed on an infrequent basis and the dump station would not be located in close proximity to off-site sensitive receptors. Thus, the project would not create objectionable odors affecting a substantial number of people. This impact would be* ***less than significant****.*

The project site currently consists of undeveloped orchards with no buildings or sensitive receptors on-site. The nearest off-site sensitive receptors to the project site is the farmhouse located 400 feet north of the Nicolaus property's northern boundary and 1,200 feet east of the Singh property. The exposure of sensitive receptors to odors from project construction and operation are discussed separately below.

Short-Term Construction-Related Odor Emissions

The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as emissions associated with paving and the application of architectural coatings may be considered offensive to some individuals. However, because odors would be temporary and would disperse rapidly with distance from the source, construction-generated odors would not result in the frequent exposure of area receptors to objectionable odor emissions. This would particularly be the case because the closest off-site sensitive receptor is the farm house located 400 feet from the Nicolaus property.

Long-Term Operation-Related Odor Emissions

The daily operations of campgrounds and state park recreational uses are typically not considered a major odor source. Exhaust fumes associated with the use of individual generators at the RV campsite would not be generated because every RV site would have its own electrical pedestal. Emissions of odorous compounds may be released during the pumping of the RV dump station near the RV campground. However, this maintenance activity would occur infrequently and the dump station would be located near the relocated BSRSP headquarters (the Nicolaus farm complex), which is approximately 1,800 feet from the nearest off-site sensitive receptor. As a result, this impact would be ***less than significant***.

IMPACT 4.6-e Toxic Air Contaminant Emissions. *The proposed project would not be a source of TAC emissions, and there are no sources of TAC emissions near the project site; therefore, the project would not result in the exposure of sensitive receptors to TAC emissions that exceed recommended thresholds. This would be considered a* ***less-than-significant*** *impact.*

The potential for exposure of sensitive receptors to toxic air emissions from the use of equipment during short-term restoration and construction activities, stationary sources, and on- and off-site mobile sources are discussed separately below.

Short-Term Mobile-Source TAC Emissions during Restoration and Construction

Restoration and construction activities proposed by the project would result in diesel exhaust emissions from on-site heavy-duty equipment. Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by ARB in 1998. Proposed restoration and construction activities would generate diesel PM emissions from the use of off-road diesel equipment required for site grading and earth movement, paving, and other construction activities. The dose to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of

exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Salinas, pers. comm., 2004). Thus, the estimated 4-year duration of proposed restoration and construction activities would only constitute approximately 6% of the total exposure period. Because the use of mobilized equipment would be temporary and there are no sensitive receptors located in close proximity to the project site, diesel PM from restoration and construction activities would not be anticipated to result in the exposure of sensitive receptors to levels that exceed the applicable standards.

Long-Term Operational TAC Emissions

The proposed project consists of the expansion of an existing state park for the restoration of orchards to native habitat and the long-term operation of a new campground. Campgrounds and state parks do not typically draw a considerable number of diesel-fueled vehicles and are not considered a source of TACs. In addition, there are no sensitive receptors located in close proximity to the project site.

Furthermore, there are no major stationary sources of TACs (e.g., industry) or mobile sources of TACs (e.g., freeways, railyards) in the vicinity of the project site. Pursuant to BCAQMD Rule 400, all stationary sources having the potential to emit TACs are required to obtain permits. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including BCAQMD Rule 401. Given that compliance with applicable standards is required for the development and operation of facilities that may emit TACs, the TAC emissions at the project site are expected to be within established standards. Therefore, this would be considered a ***less-than-significant*** impact.

IMPACT 4.6-f Greenhouse Gas Emissions. *While the project could potentially result in a net increase or decrease in GHG emissions, the size of the change would be considered nominal. Nonetheless, if the project contributed a net increase in GHG emissions, the amount would be less than considerable. This impact would be* ***less than significant****.*

No air district or other regulatory agency in California has identified a significance threshold for (GHG emissions generated by a proposed project, or a methodology for analyzing impacts related to GHG emissions or global climate change. By adoption of AB 32 and SB 97; however, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California. AB 32, California Climate Solutions Act of 2006 (See Statutes 2006, Chapter 488, enacting Health & Safety Code, Sections 38500–38599), establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. Although AB 32 did not amend CEQA, the legislation does include language identifying the various environmental problems in California caused by global warming (Health & Safety Code, Section 38501[a]). SB 97, however, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA and requires the Governor's Office of Planning and Research to prepare State CEQA Guidelines revisions addressing the mitigation of GHGs or their consequences (Statutes 2007, Chapter 185 enacting Public Resources Code Sections 21083.05 and 21097).

The proper context for addressing the issue in a CEQA document is the discussion of cumulative impacts, since while the emissions of one single project would not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact concerning global climate change. To meet GHG emission targets of AB 32, California would need to generate less GHG emissions than current levels. It is recognized, however, that for most projects no simple metric is available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32.

The text of AB 32 strongly suggests that when ARB interprets and applies the definition of "Greenhouse gas emission source," the regulations issued under the legislation will apply primarily, if not exclusively, to stationary sources of GHG emissions (see Health & Safety Code, Section 38505[i]). However, this mandate demonstrates California's commitment to reducing the rate of GHG emissions and the state's associated contribution to climate change. It does not intend to limit economic or population growth. While the text of AB 32 focuses on major stationary and area sources of GHG emissions, the primary objective of AB 32 is to reduce California's contribution to global climate change by reducing California's total annual production of GHG emissions. The impact that GHG emissions have on global climate change does not depend on whether the emissions were generated by stationary, mobile, or area sources, or whether they were generated in one region or another. Thus, consistency with the state's requirements for GHG emissions reductions is the best metric for determining whether the proposed project would contribute to global warming. In the case of the proposed project, if the project substantially impairs the state's ability to conform with the mandate to reduce GHG emissions to 1990 levels by the year 2020, then the impact of the project would be cumulatively considerable (i.e., significant).

GHG emissions generated during construction and operation of the proposed project would predominantly be in the form of CO_2. In comparison to criteria air pollutants, such as ozone and PM_{10}, CO_2 and other GHG emissions persist in the atmosphere for a much longer period of time. GHG sources associated with restoration and construction activities of the project would include the operation of off-road construction equipment, worker vehicle trips, and trips by haul trucks bringing materials to the sites. While GHG emissions generated by these restoration and construction activities may be considered new, they would be temporary in nature and would not be considered substantial given the project's small size. Also, it would be speculative to determine whether GHG emissions associated with the restoration of 170 acres of orchard to native habitat would be lesser or greater than the GHG emissions generated by continued operation of the existing walnut and almond orchards. In addition, while removal of the orchards would result in a reduction in carbon-sequestering trees, new plantings would be cultivated that would also provide the benefit of carbon sequestration.

New long-term operational-GHG emissions associated with operation of the expanded Bidwell-Sacramento River State Park would be generated by vehicle trips by park visitors and campfires at the new park campground. No stationary sources of GHG emissions would be associated with the project. Based on the same URBEMIS modeling used to estimate criteria air pollutant and precursor emissions (as summarized in Table 4.6-2) and additional assumptions about projected seasonal use patterns of the park, vehicle trips and campfires would generate approximately 670 and 470 tons of CO_2 per year, respectively. Additional, indirect-source GHG emissions would also be generated from the consumption of electricity at the campgrounds and new park headquarters.

For a number of reasons, it would be too speculative to determine whether the total operational GHG emissions generated by the proposed project would be new emissions. For example, if the new campground and expanded park were not developed, it is unknown whether visitors using the park's new facilities would have otherwise sought similar recreational opportunities at other existing parks in the region. Also, if the same individuals would be using other parks, it is unknown whether they would be traveling to more-distant recreation areas, resulting in increased vehicle-miles traveled and associated GHG emissions. It is conceivable that the expansion of Bidwell-Sacramento River State Park could reduce recreational-related vehicle-miles traveled given that it is less than 8 miles from Chico, a major population center in the region. Presently the closest recreational areas to Chico are at Woodson Bridge State Recreation Area, located 22 miles away, and around Lake Oroville, which is more than 25 miles away. Furthermore, it is unknown whether long-term GHG emissions associated with the proposed campground and expanded day-use facilities would be substantially different than the level of GHG emissions that would be generated by the continued cultivation of the existing walnut and almond orchards. Thus, it is indeterminate whether the long-term net change in GHG emissions associated with the proposed project would be an increase or decrease. Nonetheless, the quantity of the net change would be considered nominal because the project would not directly represent an increase in the state's population by providing additional permanent residences, or represent an expansion of the state's economy by providing a substantial amount of commercial activity or a considerable number of new jobs (i.e., only one additional park ranger position would be created if

funding is made available). In addition, the measures required by Mitigation Measure 4.6-b to reduce or offset regional criteria air pollutant emissions would also act to reduce project-related GHG emissions. Therefore, any potential contribution by the project to a net increase in GHG emissions would be less than considerable. This cumulative impact would be ***less than significant***.

4.6.5 MITIGATION MEASURES

Mitigation Measure 4.6-a: Implement Measures to Reduce Short-Term Restoration- and Construction Emissions of ROG, NO_X, and PM_{10}

In accordance with BCAQMD recommendations, State Parks shall require restoration and construction contractors to implement the following measures to reduce emissions generated by restoration and construction activities:

- No open burning shall be performed on the project site. Use alternatives to open burning of vegetative material such as reuse of biomass material for habitat restoration; chipping; or mulching. Alternatively, vegetative material could be hauled/provided to a biomass power facility. The closest biomass power facility is operated jointly by Pacific Oroville Power, Inc. in conjunction with NorCal Waste Systems.
- On-site vehicles shall be limited to a speed of 15 mph on unpaved roads and surfaces.
- A publicly visible sign shall be posted at the site with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 24 hours. BCAQMD's telephone number shall also be visible to ensure compliance with BCAQMD Rule 200 & 205 (Nuisance and Fugitive Dust Emissions).
- Vehicles entering or exiting the project site shall travel at a speed which minimizes dust emissions and trackout.
- Restoration and construction workers shall park in designated parking areas(s) to help reduce dust emissions. Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust emissions.
- Dust suppression measures shall be applied to disturbed areas that are unused for at least four consecutive days. Measures may include the following: frequent watering (a minimum of 2 times per day); covering with weed-free straw mulch; or application of chemical stabilizers.
- Vegetative ground cover shall be planted in disturbed areas as soon as possible.
- Land clearing, grading, earth moving, or excavation activities shall be suspended when winds exceed 20 miles per hour.
- Paved streets adjacent to the restoration and construction sites shall be swept or washed at the end of each day as necessary to remove excessive accumulations of silt and/or mud which may have accumulated as a result of activities on the project sites.
- When not in use, idling of on-site equipment shall be minimized. Under no conditions shall on-site equipment shall be left idling for more than 5 minutes.

Implementation of Mitigation Measure 4.6-a would incorporate all applicable BCAQMD-recommended measures to reduce emissions generated by restoration and construction activities. For this reason, short-term construction emissions would be reduced to a ***less-than-significant*** level.

Mitigation Measure 4.6-b: Prohibit campfires during burn bans established by Cal-Fire and/or BCAQMD's "Don't Light Tonight" Advisory Program.

Pursuant to Park Plan Guideline AO-3.3-2, which states that State Parks shall establish appropriate campfire restrictions, through coordination with the local air district in conjunction with the development of an overnight campground at the Park, State Parks shall notify park users of all burn-ban periods determined by the California Department of Forestry and Fire Protection. Burn-ban periods established by the California Department of Forestry and Fire Protection apply to all vegetative and wood burning, including campfires and other burning activities on state land inside Butte County, with no exceptions made by BCAQMD Rule 300, part 2.10 (Williams, pers. comm., 2007). BCAQMD Rule 300, part 2.10 exempts campfires and some other types of burning from burn prohibitions established by other BCAQMD rules. Typically, the California Department of Forestry and Fire Protection begins the burn ban season around July 1 and it extends through October. In addition, the campgrounds at BSRSP shall also participate in BCAQMD's "Don't Light Tonight" program, in which BCAQMD requests that County residents not use woodstoves and fireplaces when air pollution approaches unhealthy levels (BCAQMD 2007c). These advisories are typically in effect for 24-hour periods. State Parks shall keep campground users informed of burn bans by posting notices on kiosks at the park headquarters, self-pay kiosks, and campground restroom and shower facilities. State Parks shall also inform campground users of burn bans upon check-in to the campground.

Implementation of Mitigation Measure 4.6-b would eliminate all campfire emissions during times of the year when the NSVAB experiences minimal atmospheric dispersion. Because campfire burning would be limited to times of the year when wood smoke would be adequately dispersed and therefore not expose sensitive receptors to substantial pollutant concentrations or cause or contribute to the County's nonattainment status with respect to ozone or PM_{10}, this measure would reduce long-term operation-related emissions to a ***less-than-significant*** level.